MTI Recommendation Explanation User's Manual

The MTI Recommendation Explanation (MTI-RE) page was designed to provide the details behind all of the recommendations MTI makes for a given citation. We also wanted to provide an environment where the person using the MTI-RE would have access to all of the available resources they might need in evaluating the MTI recommendations.

In some cases, we have more detailed information to display then others because the MetaMap method provides a much richer set of details about where a recommendation came from and why MTI recommended the term then from the PubMed Related Citations method.

Highlights of the new MTI-RE web page include:

- All words and phrases in the citation that participated in the MTI recommendations are highlighted
- Access to MeSH Browser information on all MTI recommendations
- Access to all PubMed Related Citations for the citation
- Detailed information on why MTI recommended the terms that it did
- Information on when MTI processed the citation, what version of MeSH was used, and what version of PubMed Related Citations was used.

For PubMed Related Citations, we are now using two different methods of generating the list of related articles. MTI has traditionally used the "TexTool Related Articles" method because it has the ability to handle a wider variety of input formats, but we are now moving to using the precomputed Entrez/PubMed Related Articles links since these are what an Indexer would normally see in the DCMS "Related Articles" tab.

1. **PubMed Related Articles** – This uses the already computed Entrez/PubMed Related Articles links to determine what citations to pull the MeSH Heading information from.
2. **TexTool Related Articles** – This uses the TexTool program to determine the list of nearest related articles for the given citation. This method provides a similar list as the precomputed list from Entrez/PubMed, but has a bit more flexibility which MTI needs in specific cases. If a given article to be processed for the DCMS system does not contain a precomputed list of Entrez/PubMed Related Articles, we will use the TexTool program to generate the list.

MTI Recommendation Explanation User's Manual

The following screen shot (Figure 1) shows what the MTI-RE looks like when it starts up. The top of the page details when the citation was processed by MTI, what version of MeSH was used, and what version of PubMed Related Citations (PRC) was used. Below this, on the left-hand side are all of the MTI recommendations with the CheckTags at the top highlighted in a tan color, and the actual citation on the right-hand side. The citation has all of the words and phrases involved in the MTI recommendations highlighted using a brown coloring and underlining. At the bottom of the page is where the detailed explanation information will appear.

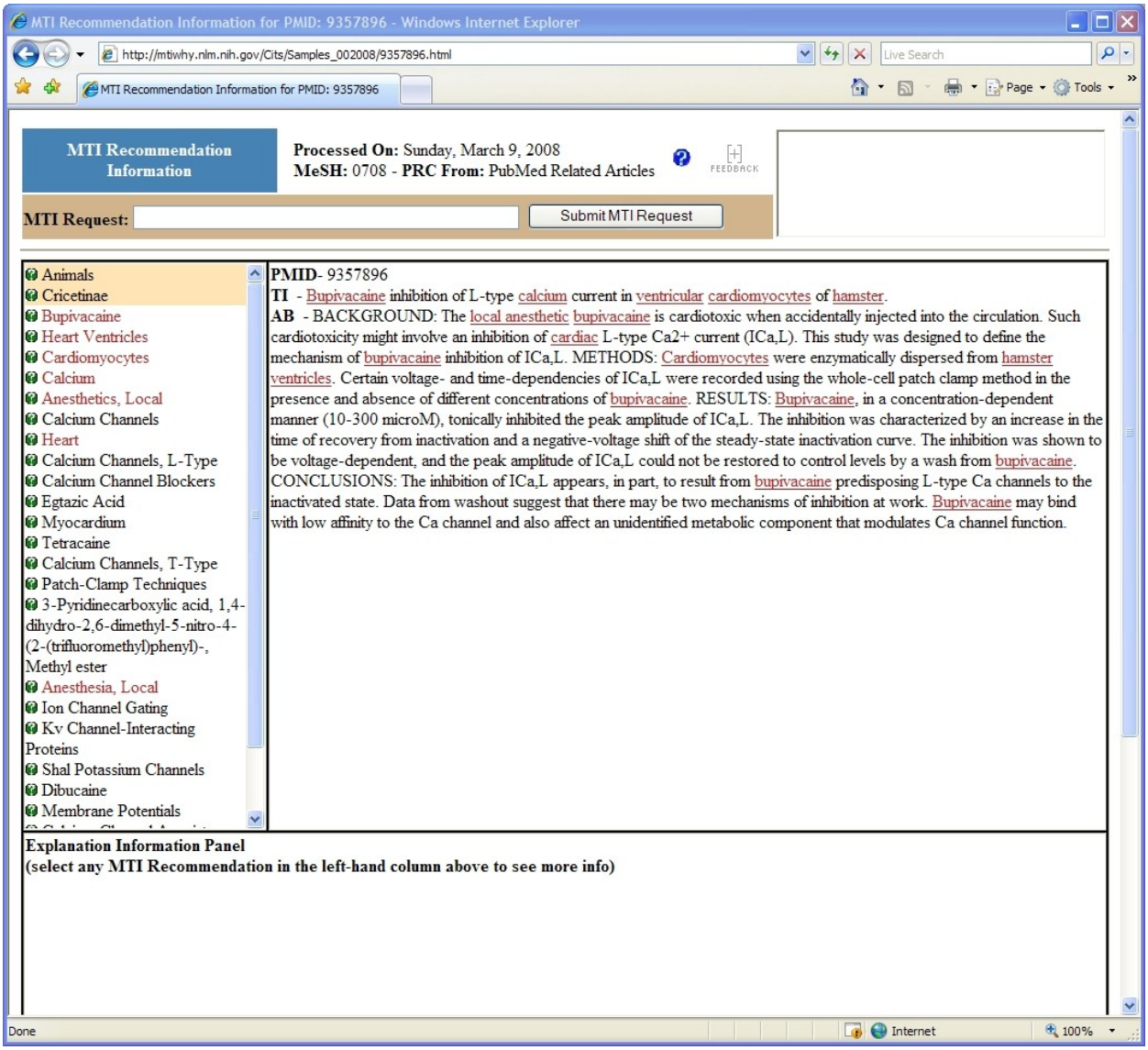

Figure 1: Initial MTI Recommendation Explanation Screen

What can you do from the startup screen?

1. Selecting the blue question mark from the top of the web page will open this document.

2. Rolling the mouse over any of the words in the citation that are highlighted by the brown color and underlining (e.g., highlighted text) will show what MTI recommendations were made using the word by displaying a bubble above the word with the MTI recommendations listed and also highlighting the appropriate MTI recommendations themselves in the panel to the left of the citation (see Figure 2).

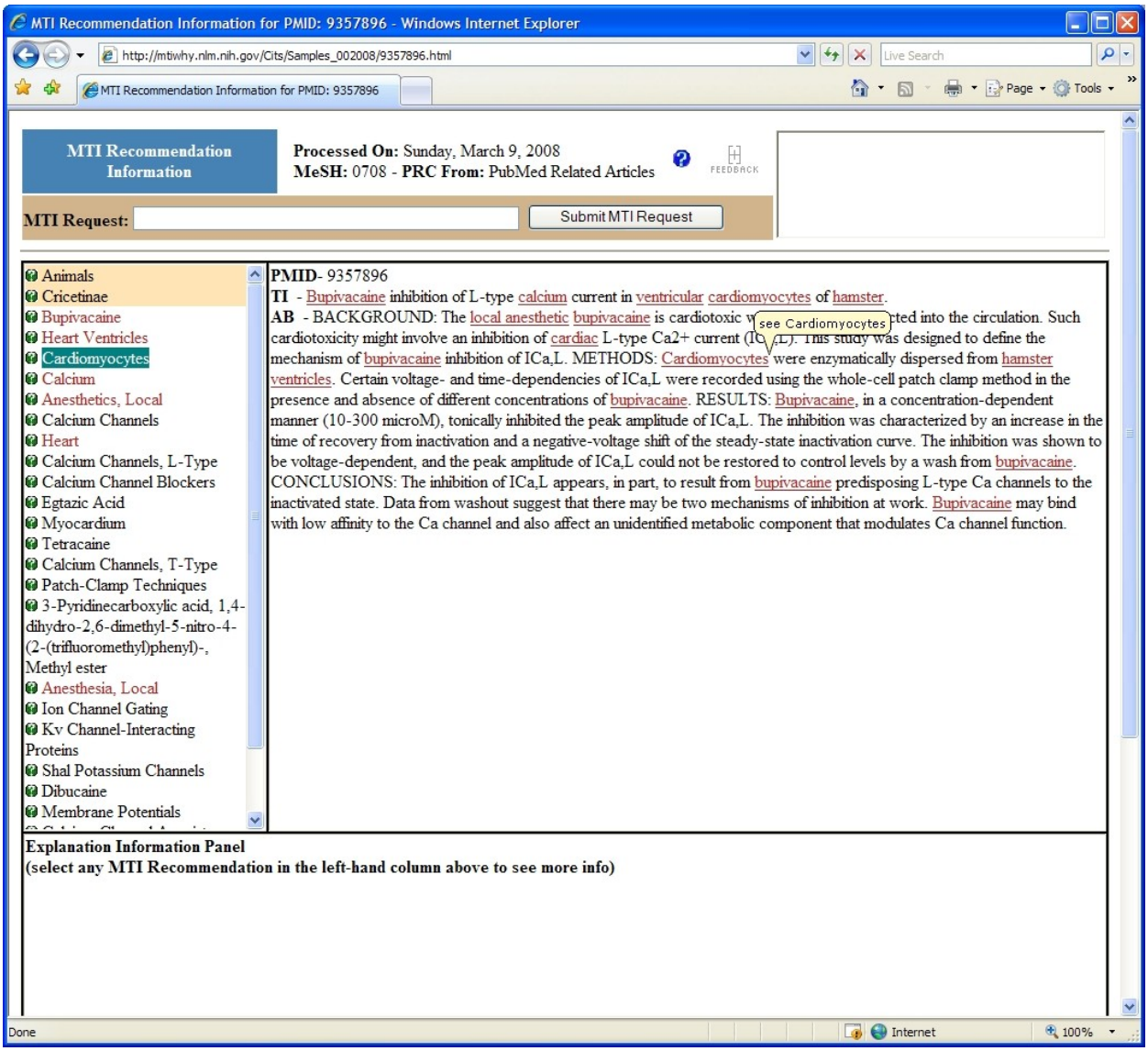

Figure 2: Text Word Mouse Over Example

3. Rolling the mouse over any of the MTI recommendations will highlight the MeSH term and also highlight all of the places in the text that caused this MeSH term to be recommended (see Figure 3).

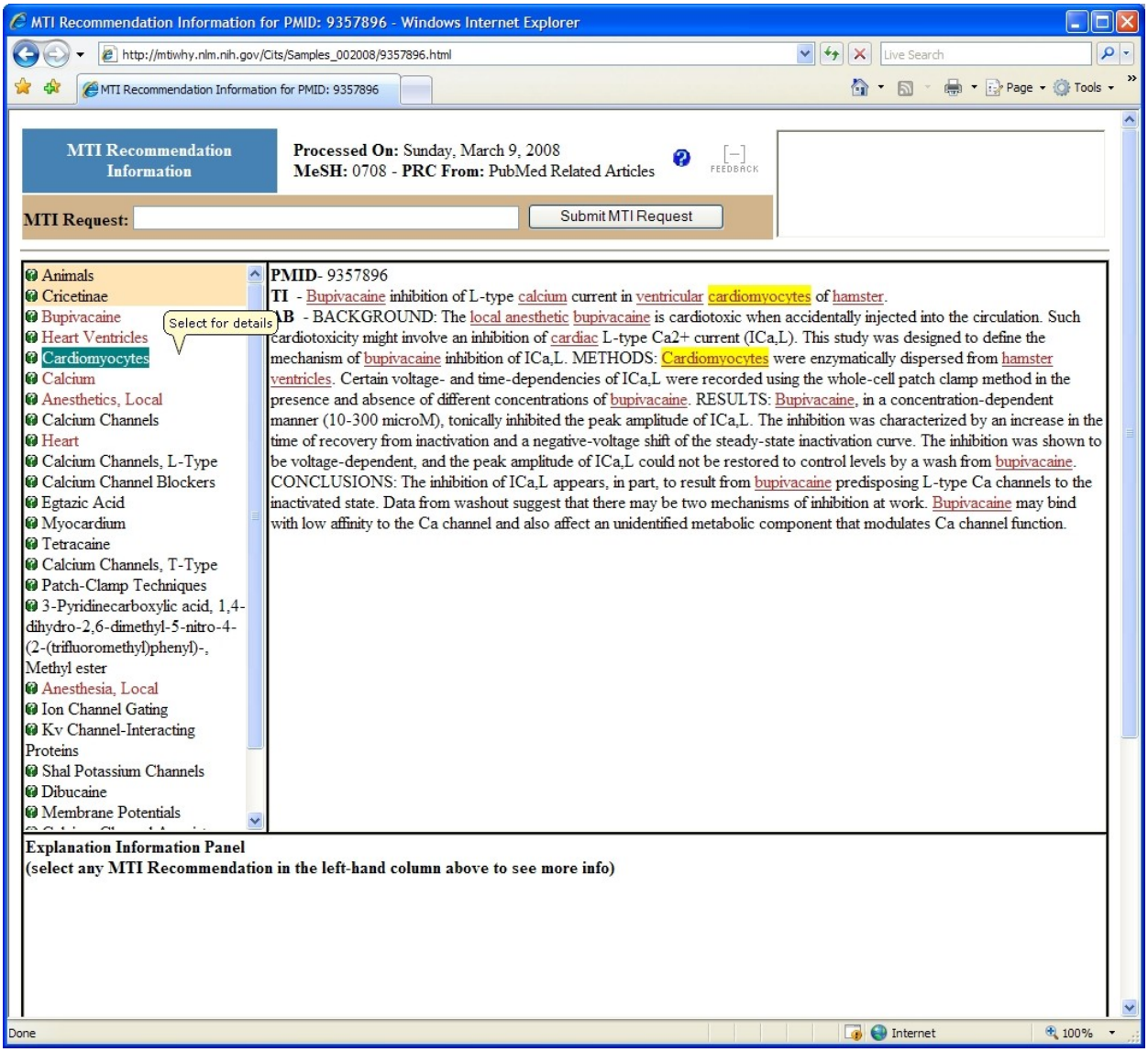

Figure 3: MTI Recommendation Mouse-Over Example

4. Selecting the question mark next to any of the MTI recommendations will popup a small window containing the MeSH Browser with the MeSH term that MTI recommended loaded. You can repeatedly do this and the same window will be used – just the information inside the window will change (see Figure 4).

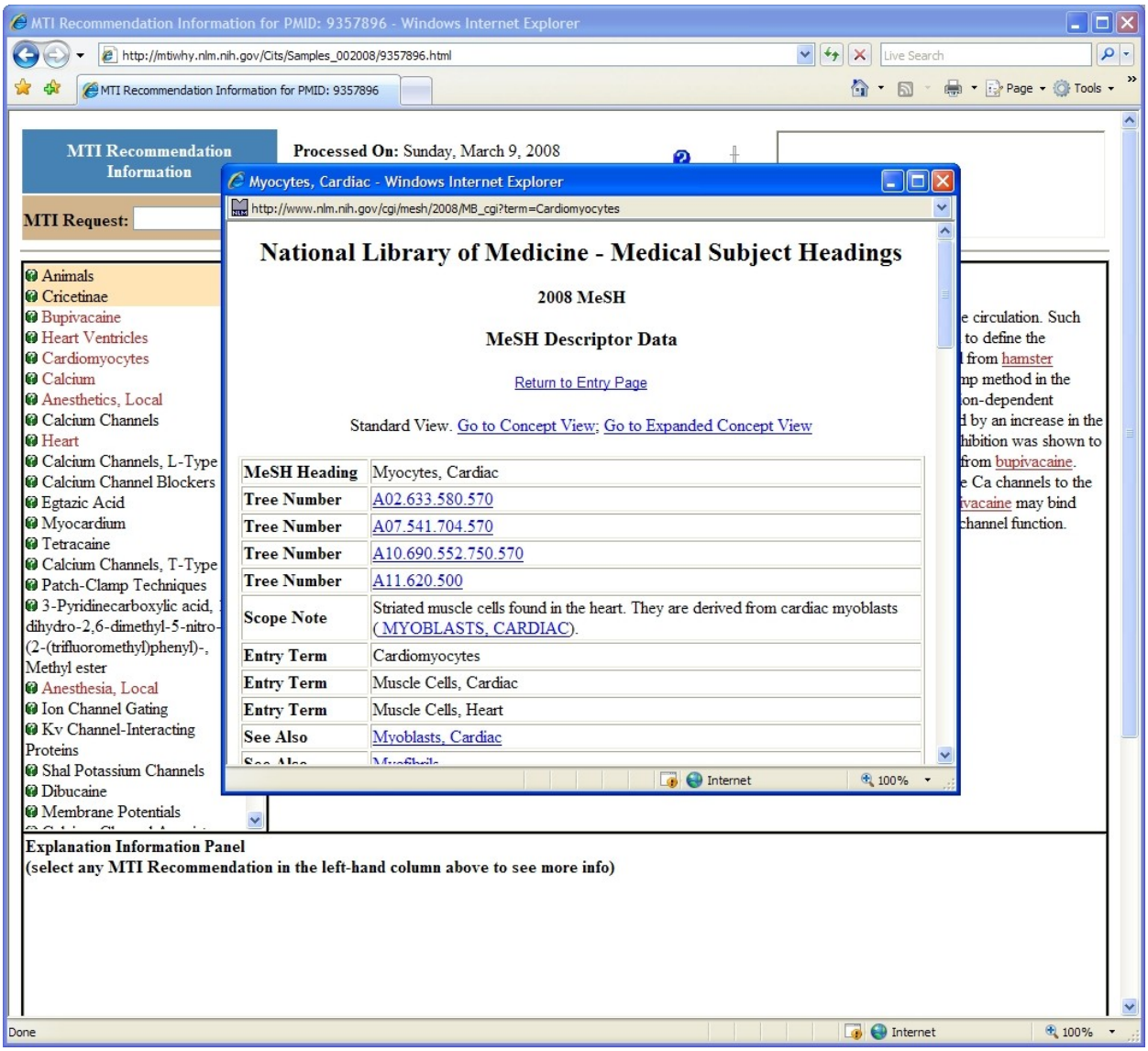

Figure 4: MeSH Browser with "Pharmaceutical Preparations" loaded

5. Selecting any of the MTI recommendations will highlight all of the words/phrases in the body of the citation that participated in MTI making the recommendation and display all of the detailed background information for the MTI recommendation in the bottom "Explanation Information Panel" (see Figure 5). The next section of this document "MTI Detailed Background Information" describes what types of background information are available.

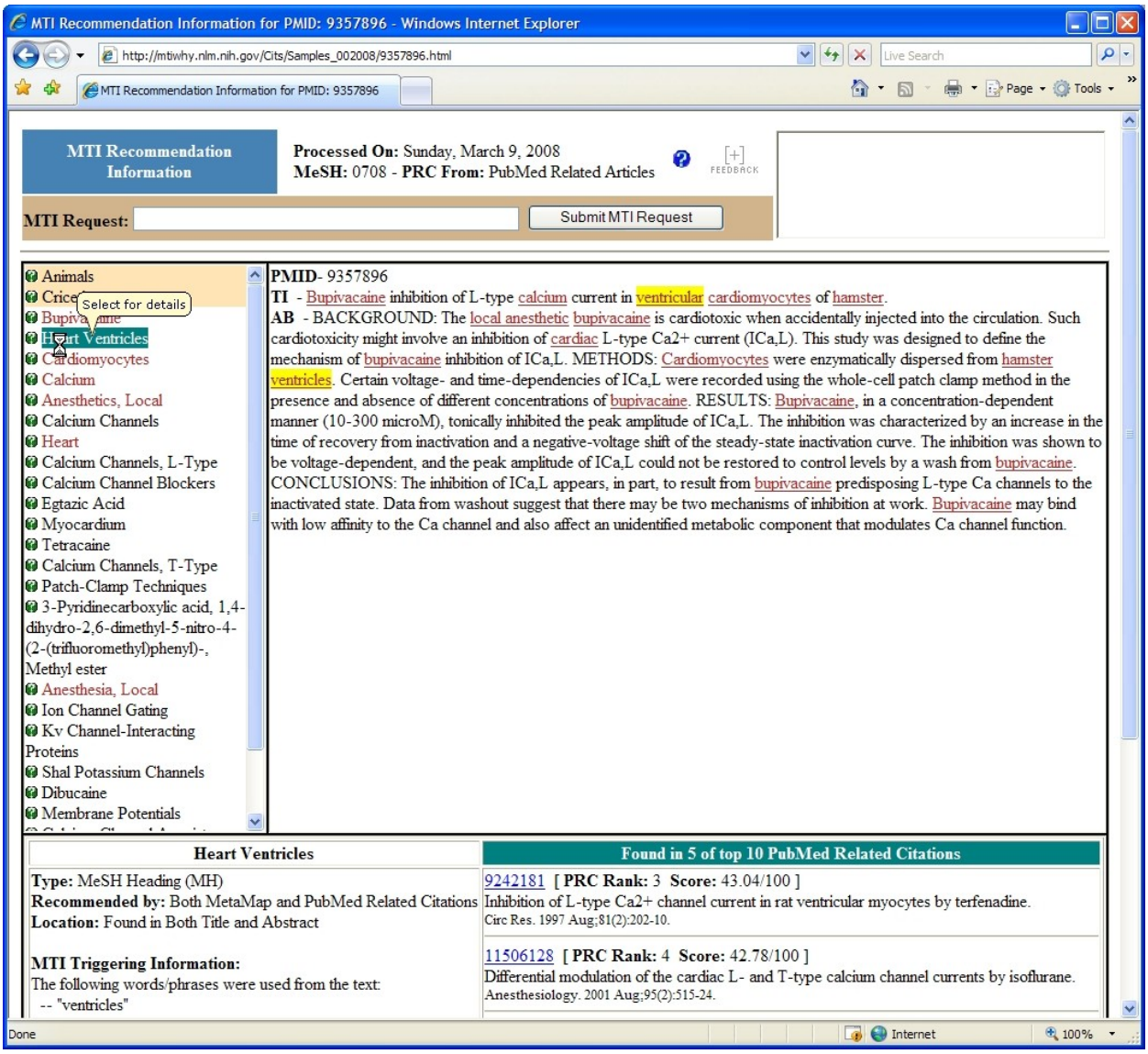

Figure 5: MTI Recommendation Selection

MTI Detailed Background Information:

When you select any of the MTI recommendations you will see the detailed background information for the word. The left-hand side of the bottom panel (see Figure 6) contains all of the background information for why MTI recommended this particular term. The right-hand side of the bottom panel (see Figure 7) contains a list of the PubMed Related Citations that participated in this particular MTI recommendation.

The MTI recommendation background information (left-hand side) will contain:

- What type of MeSH term is this (MeSH Heading, CheckTag, MeSH Entry Term, Supplemental Concept, or a MeSH Heading Mapped To)
- Which methods recommended this term (MetaMap, PubMed Related Citations, or both)
- Where the text that triggered the recommendation was found (Title, Abstract, or both). Note that only the MetaMap method contains this information, so if a term is recommended only by PubMed Related Citations, we do not have any location information.
- MTI Triggering Information will then show all of the words or phrases from the text that contributed to MTI recommending this term.

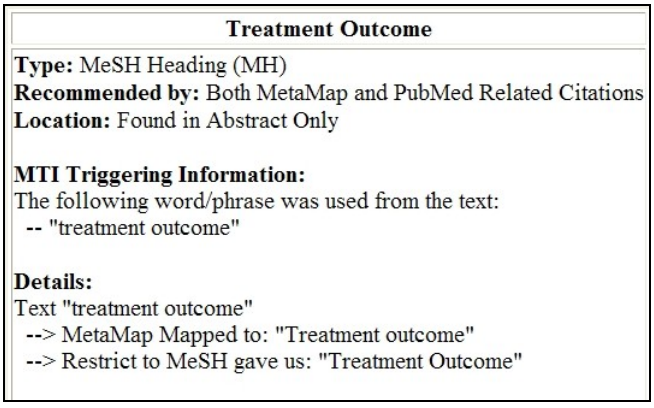

Figure 6: Left-hand side - MTI Background Information

- If you are really interested in how MTI recommended a specific term, then the "Details" section will show the logic flow from identifying the text in the article, matching (mapping) the text to the corresponding UMLS Concept(s), converting the UMLS Concept into a MeSH term (Restrict to MeSH), and then in some cases, MTI provides the MeSH Entry Term instead of the MeSH term because the MeSH Entry Term was actually shown in the text.
- You may also see the term "Ambiguously MetaMap Mapped to:" in the Details section. This simply means that MetaMap found more then one UMLS concept that matched (mapped) to the text – when this occurs, it is known as ambiguity. For example, the text "cold" maps to three different UMLS concepts in the 2007 UMLS:
  Cold (cold temperature) [Natural Phenomenon or Process],
  Cold (Common Cold) [Disease or Syndrome], and
  Cold (Cold Sensation) [Physiologic Function].

PubMed Related Citations:

The right-hand side of the bottom panel (see Figure 7) contains a list of the PubMed Related Citations that participated in this particular MTI recommendation. This section contains all of the information pertaining to the PubMed Related Citations including:

- Number of related citations participating out of the top 10 we use for MTI (in this example, we have 5 of the top 10 participating).
- PMID of the related citation. NOTE: Selecting the PMID will popup a new window containing the Entrez/PubMed entry for the PMID in "Citation" view which shows the abstract information as well as the MeSH Indexing (see Figure 8).
- PRC Rank – This is the ranking order for the given related article ranging from 1 to 10 with 1 being the highest.
- Score – Score that this related article received out of 100 (36.58/100) is a score of 36.58.
- Title of the related article followed by the Journal reference information for the article.

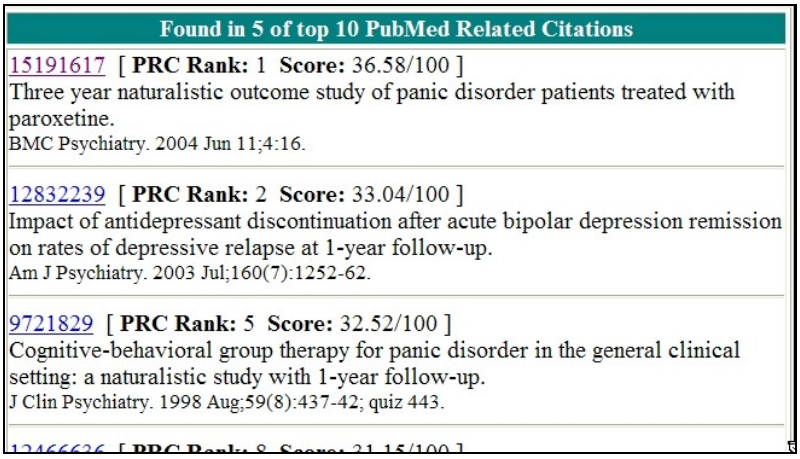

Figure 7: Right-hand side - PubMed Related Citation References

Figure 8: Entrez/PubMed in Citation View for PMID 15191617